Salmonidæ may have its use, inasmuch as the opaque white ova are more conspicuous than the transparent,—the dead than the living,—and in consequence, the one may serve as lures and divert from the others the many enemies to whom they are attractive food.

February 12, 1852.

COLONEL SABINE, R.A., V.P. and Treas., in the Chair.

The following communications were read:—

1. The subjoined Letter from Professor Haidinger to Captain Smyth, R.N., For. Sec. R.S., dated Vienna, January 15, 1852. Received January 23, 1852.

Sir,—The great success with which optical researches are treated of in the publications of the Royal Society, must make me anxious to lay before the Society, in a few words, a concise and convincing demonstration of the theorem that in a ray of polarized light the vibrations are perpendicular to the plane of polarization, conformably to the views of MM. Fresnel and Cauchy, and not in the plane of polarization, as some other mathematicians have maintained.

My demonstration is founded on the nature of dichroitic crystals, as tourmaline, sapphire, idocrase, &c. Any perfectly homogeneous crystal of this description presents two different tints of colours. One of them appears in the direction of the axis, as well as in all directions perpendicular to it, and it is always polarized in a plane passing through the axis; the other tint appears in every azimuth in the directions perpendicular to the axis, and it is polarized in a plane perpendicular to the axis. The latter of these colours does not appear at all, if the crystal is examined in the direction of the axis; if it depend at all on transverse vibrations, all vibrations of this kind, transverse or perpendicular to the axis, are at once excluded, and the only vibrations that can possibly belong to the colour of the extraordinary ray produced in the crystal, are those parallel to the direction of the axis. But agreeably to observation the plane of polarization is itself perpendicular to the axis, the *vibrations* therefore *take place* in directions *perpendicular to the plane of polarization*.

Trichroitic crystals of course will yield a similar demonstration, as cordierite, andalusite, diaspore, axinite, and others.

I shall not fail to send a copy of the communication I am to present today to the Vienna Academy, as soon as it shall have been printed.

The importance of the subject will, I am confident, plead as an apology for my trespassing on your kindness in thus making the request, that you will lay the present communication before the Royal Society.

I have the honour to be,
My dear Sir,
Your obedient Servant,
W. Haidinger.